Mountain region and the eastern parts of the middle Plateau were indicated in some districts to have sufficient snow to promise an average water supply, though the outlook as a whole for a good late water flow was discouraging.

RELATIVE HUMIDITY

The relative amount of moisture in the atmosphere was well below the normal as deduced from previous records over important areas, the deficiencies being large in many southern districts, where they ranged up to as much as 25 per cent. They were also less than normal, but to a slightly less degree, in portions of the Great Plains, Rocky Mountain, and Plateau districts, though in these areas there were small localities having values somewhat above normal, and similar conditions existed over the Pacific Coast States, along the middle Gulf coast, over portions of New England and in the upper Lake region.

SEVERE LOCAL STORMS, FEBRUARY, 1930

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Berrien County, Ga.	4					Wind	Trees blown down; old barns unroofed	Official, U. S. Weather Bureau.
Mint Hill, N. C.	4	7.30 p. m.	200		$2,000	Tornadic wind	Damage mainly to small houses, barns, and timber. Path 4 miles long.	Do.
Toole County, Mont.	10					High wind	Character of damage not reported	Do.
Central City, Ind. (near)	12				10,000	Electrical and wind.	Considerable damage to power plant at coal mine. Power lines to towns in vicinity damaged.	Do.
Cascade County, Mont.	18					Destructive wind	Many thousands of dollars damage in and near Browning.	Do.
Springfield, Ill., and vicinity.	23-24					Severe thunderstorm.	Basements flooded; street light affected; 3 barns burned.	Do.
Indianapolis and Richmond, Ind.	24					Hail and thunderstorm.	Much glass in greenhouses broken; some roofs damaged.	Do.
Roseville, Ohio (near)	24	5:30 p. m.	100-200		150,000	Severe thunderstorm and tornadic wind.	Heavy property loss; 4 persons injured; 300 people suffered temporary loss of work. Path about 1 mile long.	Do.
San Francisco, Calif.	24					Thunderstorm and wind.	Some damage by lightning	Do.
Cairo, Ill.	25	P. m.			1,300	do	Pumping plant damaged	Do.
San Jose, Calif.	26	4 p. m.				Hail and wind	Street car service interrupted, some roofs damaged and trees broken.	Do.

RIVERS AND FLOODS

By R. E. SPENCER

Details of overflow and damage caused by the flood in the Wabash system in January, 1930, which had not been received in time for inclusion in the REVIEW for that month, are given below. The quotation, taken from the report of Mr. J. H. Armington, official in charge of the Indianapolis, Ind., office of the Weather Bureau, includes also some further comment on precipitation and stages, with particular reference to comparative features of the 1913 and 1930 floods:

The stages reached in the great flood of March, 1913, except at Vincennes on the Wabash and at Decker on the White, considerably exceeded those of January, 1930. At most points on the White the crests of the January flood were exceeded also by those of February, 1916; and the same was the case at a few points on the middle Wabash, particularly at Terre Haute, although the difference at Terre Haute was but 0.4 foot. Therefore, as the severity of flooding was not so great above the junction of the forks of the White and above the middle-upper Wabash, estimates on areas inundated are confined to the Wabash Valley from Tippecanoe County downstream to the mouth.

Along that stretch of the river a total of approximately 684 square miles were overflowed, 293 square miles being in Illinois and 391 square miles in Indiana. The most extensive and most severe flooding, however, was from Knox County southward on the Indiana side and from Lawrence County southward on the Illinois side of the river. Lawrence County heads the list with 121 square miles of flooded territory, while Gibson and Knox Counties are second and third, with 91 and 87 square miles, respectively, and Posey County is fourth, with 86 square miles.

Had it not been for the breaking of levees from Vincennes upstream past Terre Haute and for the further stage diminution caused by the opening of levee gates above Terre Haute and by the severe cold which overspread the entire region just as the water was approaching its highest points, the stages reached above Vincennes would undoubtedly have been considerably higher than they were. As it was, the crests were not only reduced, but their occurrence was considerably hastened in point of time; so that, from source to mouth, they occurred within a period of about three days, whereas ordinarily the flood wave requires somewhat more than a week to run its course.

Even without the reduction thus produced, however, it is practically certain that the crests of the January flood would not have been as high as those of the flood of March, 1913, unless the building and changing of levees since that time has materially altered flood heights. This conclusion is based on the fact that the average rainfall over the entire Wabash Valley in the flood of March, 1913, was more than 1 inch greater in its period of five days than was the average rainfall over the same region in the flood of January, 1930, over its period of eight days. Even the somewhat higher initial stages which at most places preceded the period of rainfall in 1930 would not balance the greater amount of rainfall and shorter period in 1913. It may be noted in passing that careful study of the 1913 situation at Vincennes has placed the crest of the flood in that year at 28 feet at least had it not been for wide breaks in the levees of both Wabash and tributary streams. The same statements are applicable to the main stream of White River from the junction of the forks to its mouth.

Damage and loss caused by flooding.—Data on damage and loss by flooding are given below for the Wabash and the White Valleys separately:

Losses and damage in the Wabash Valley proper:

Item No. 1, tangible property—	
Levees	$75,930
Public utilities	4,000
Industries	111,463
Railroads	240,301
Cities and communities	34,600
Fences	510,850
Roads and bridges	113,000
Total	1,090,144
Item No. 2, farm property—	
(*a*) Matured crops	3,818,550
(*b*) Prospective crops	463,530
(*c*) Equipment, livestock, etc	601,110
Total	4,883,190

Losses and damage in the Wabash Valley proper—Con.	
Item No. 3, suspension of business	$167,278
Grand total, Wabash Valley	6,140,612
Item No. 4, property saved by flood warnings, value of	482,500
Losses and damage in White River Valley:	
Item No. 1, tangible property	349,008
Item No. 2, farm property—	
(*a*) Matured crops	290,925
(*b*) Prospective crops	27,960
(*c*) Equipment, livestock, etc	20,300
Total	339,185
Item No. 3, suspension of business	33,500
Grand total, White River Valley	721,693
Item No. 4, property saved by flood warnings, value of	81,850

The grand total of all losses reported in the combined Wabash-White system in the January, 1930, flood is therefore $6,862,305, and the total value of property saved as a result of flood warnings issued is $564,350.

Other reports received too late for inclusion in the January REVIEW describe the floods of the Illinois, Meramec, Black, and upper St. Francis Rivers in that month as generally moderate. On the Meramec a loss of about $150 resulted from suspension of business. In the vicinity of Poplar Bluff, Mo., on the Black River, damage to the extent of $26,000 occurred, distributed as follows: Matured crops, $5,000; prospective crops, $10,000; livestock and other movable property, $1,000; suspension of business, $10,000. At Fisk, Mo., on the St. Francis River, about $5,500 was lost owing to suspension of business.

Report on the Tallahatchie River flood of and following January, which was to have appeared in this issue of the REVIEW, is again delayed for the reason that the flood had not finally subsided at the end of February.

Floods during February were generally of little consequence.

In the Atlantic drainage no damage occurred.

The most important result of the moderate thaw and ice rises in the Great Lakes drainage was a loss of $1,165 at Flint, Mich., from flooded basements. A saving of $500 was affected through Weather Bureau warnings along the Saginaw River.

In the Ohio drainage two inconsequential ice gorges formed in the Allegheny River—one at Kittanning and the other at Dam No. 8; about $1,000 was lost because of business suspension in Pittsburgh; and some inconvenience was experienced in dam operation during the ice movement in the Ohio. The rises in the interior rivers of Ohio were of no special importance, nor was that in the Wabash-White system, where practically all possible damage had been done by the greater flood of January.

Reports on the rises in the Illinois, Meramec, and St. Francis Rivers, though so far incomplete, indicate that these floods were of little or no consequence, as were also the remainder of lower Mississippi drainage rises, except those in the Tallahatchie and Sulphur Rivers. Discussion of the Tallahatchie flood, which continued into March, will appear later. Along the Sulphur River highways were damaged to the extent of $1,500, $500 worth of livestock was drowned, and $2,500 loss resulted from suspension of business. The value of Weather Bureau flood warnings was estimated at $11,000.

The Trinity River flood of Texas was unimportant.

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[All dates in February unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
	Feet			*Feet*	
Roanoke: Weldon, N. C.	30	6	7	31.6	7
Nuse: Smithfield, N. C.	14	6	8	14.5	6–7
Cape Fear: Elizabethtown, N. C.	22	6	8	24.8	7
Peedee: Mars Bluff, S. C.	17	6	12	19.0	9
Santee:					
Rimini, S. C.	12	(1)	13	21.0	Oct. 7, 1929
		22	(2)	13.3	23
Ferguson, S. C.	12	(1)	18	13.4	11–12
		21	(2)	12.6	24
Altamaha:					
Charlotte, Ga.	15	4	12	16.8	7–8
Everett City, Ga.	10	3	18	11.0	10–12
Ocmulgee: Abbeville, Ga.	11	4	9	12.3	6
EAST GULF DRAINAGE					
West Pearl: Pearl River, La.	13	(1)	16	14.9	3–4
GREAT LAKES DRAINAGE					
St. Joseph: Montpelier, Ohio	10	21	21	10.9	21
		24	26	10.7	26
Saginaw: Saginaw, Mich.	19	25	(2)	20.7	27
Flint: Flint, Mich.	11	23	(2)	12.8	25
Pine: Alma, Mich.	7	24	27	9.2	25
Cass: Vassar, Mich.	14	26	26	15.0	26
Grand:					
Eaton Rapids, Mich.	5	21	(2)	5.4	22
Grand Ledge, Mich.	7	21	28	8.2	24
Lowell, Mich.	15	27	27	15.1	27
Grand Rapids, Mich.	11	23	(2)	13.3	28
Red Cedar:					
Williamston, Mich.	6	20	24	7.0	21
East Lansing, Mich.	8	21	22	8.9	22
MISSISSIPPI DRAINAGE					
Allegheny:					
Lock 5, Freeport, Pa.	24	25	27	27.2	27
Lock 4, Natrona, Pa.	24	27	27	24.8	27
Kiskiminetas: Saltsburg, Pa.	8	25	25	8.2	25
Tuscarawas:					
Newcomerstown, Ohio	10	28	28	11.3	28
Coshocton, Ohio	8	26	28	12.0	27
Walhonding: Walhonding, Ohio	8	25	27	11.2	26
Scioto:					
Bellpoint, Ohio	9	26	27	9.4	26
Circleville, Ohio	10	26	28	13.8	27
Chillicothe, Ohio	16	27	28	19.1	28
Olentangy: Delaware, Ohio	9	26	26	11.7	26
Green:					
Munfordville, Ky.	21	6	6	21.4	6
Lock 4, Woodbury, Ky.	33	6	7	33.5	7
Wabash:					
Lafayette, Ind.	13	26	28	15.4	27
Covington, Ind.	16	6	10	17.0	8
		26	(2)		
Terre Haute, Ind.	16	28	(2)		
Mount Carmel, Ill.	16	15	17	16.3	16
		28	(2)		
Tippecanoe: Norway, Ind.	6	23	(2)	6.5	24
White, East Fork: Seymour, Ind.	10	13	13	10.5	13
White, West Fork:					
Anderson, Ind.	12	26	27	12.8	27
Elliston, Ind.	19	27	(2)		
Edwardsport, Ind.	15	14	16	16.6	15
		27	(2)		
Mississippi: Vicksburg, Miss.	45	(1)	6	45.7	3
Illinois:					
Morris, Ill.	13	25	28	14.4	26
Peru, Ill.	14	(1)	(2)	18.4	27
Henry, Ill.	10	25	(2)		
Peoria, Ill.	18	27	(2)		
Havana, Ill.	14	(1)	(2)		
Beardstown, Ill.	14	(1)	3	14.3	Jan. 31–Feb. 1
		9	(2)		
Pearl, Ill.	12	(1)	10	13.6	Jan. 29–30
					Feb. 7
		14	15	12.2	14–15
		23	(2)		
Meramec:					
Steelville, Mo.	12	26	26	12.9	26
Pacific, Mo.	11	26	(2)	14.9	28
Valley Park, Mo.	14	27	(2)	15.6	27
St. Francis:					
Chaonia, Mo.	22	5	6	23.4	6
		27	27	22.7	27
Fisk, Mo.	20	5	9	23.2	7
		28	(2)		
St. Francis, Ark.	18	5	15	20.4	10
Marked Tree, Ark.	17	(1)	22	18.7	4–6
Osage: Osceola, Mo.	20	7	11	20.9	9
Arkansas: Yancopin, Ark.	29	(1)	28	35.0	Jan. 27–30
Petit Jean: Danville, Ark.	20	5	7	21.9	6
White:					
Georgetown, Ark.	22	6	15	22.8	11
DeValls Bluff, Ark.	24	13	13	24.0	13

[1] Continued from last month.
[2] Continued at end of month.

[All dates in February unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE—continued					
Black:	*Feet*			*Feet*	
Corning, Ark.	11	(1)	1	14.8	Jan. 20
		4	19	13.0	7-8
		28	28	11.1	28
Black Rock, Ark.	14	(1)	1	23.6	Jan. 15
		4	15	18.5	6
Cache: Patterson, Ark.	9	(1)	18	11.5	Jan. 15
Tallahatchie: Swan Lake, Miss.	25	(1)	(2)	31.9	Jan. 27-29
Sulphur:					
Ringo Crossing, Tex.	20	4	5	21.8	5
Finley, Tex.	24	7	11	26.3	8
Ouachita:					
Arkadelphia, Ark.	12	4	6	18.9	5
Camden, Ark.	30	7	12	34.8	9
WEST GULF DRAINAGE					
Trinity:					
Trinidad, Tex.	28	6	6	28.8	6
Liberty, Tex.	25	7	10	25.8	8-9

[1] Continued from last month. [2] Continued at end of month.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, FEBRUARY, 1930

By J. B. KINCER

General summary.—The weather for February, 1930, was in marked contrast to January, for temperatures were decidedly above normal, particularly in those sections that had the greatest minus departures in January. Some areas showed a range of about 25° in the departures from normal for the two months, varying from −12° in January to +16° or more in February.

The mild weather during the first decade was favorable for outside operations, but the soil remained too wet to work in many areas, although abundant sunshine aided in drying. The main wheat sections were mostly bare of snow, with some complaints of heaving in the Ohio Valley, while parts of the southwestern belt continued dry. Winter truck crops made satisfactory advance in the South and the weather generally favored livestock interests in the great western grazing areas. Plowing was largely prevented in the Corn Belt due to wet soil, but seasonal operations made fairly good advance in the Cotton Belt.

During the second decade there was a rather severe cold wave, but the period was fairly favorable for agricultural interests. Wheat fields were partially protected in the main producing sections, but toward the close of the decade they were again mostly bare; there were some further complaints of freezing and thawing in interior valleys. There were no material damaging low temperatures in the South and winter truck crops made fairly good advance, except for too much moisture on the lowlands of Florida. Livestock were again favored; plowing was rather inactive in the Corn Belt, but much work was accomplished in the Cotton Belt.

During the last decade the continued mild weather caused rapid advance of vegetation generally and especially to early fruit trees, with decided swelling of buds noted north to the central valley areas and some early plum bloom showing in the lower Ohio Valley. There was much apprehension felt at the close of the month from possible frost injury. The period was generally ideal for outside operations and much spring work was accomplished. Grass and wheat fields showed a decided greening to central valley sections and the weather conditions were favorable in the western range country. The soil continued too wet in many parts of the Corn Belt for active preparation of the soil, but in the Cotton Belt much plowing was accomplished.

Small grains.—The mild weather during the first decade caused the snow to disappear rapidly and large areas were bare. There were no indications of serious injury from the January freezes, but reports of unfavorable freezing and thawing came from the Ohio Valley, although no material damage was indicated. The remaining oat crop made fair advance in the South, while the soil was too wet for spring seeding. There was further reduction of the snow cover in the Northwest during the second decade, while freezing and thawing conditions continued in the Ohio Valley, although damage was not extensive. Winter wheat was mostly satisfactory and precipitation was favorable in the Pacific Northwest. Winter cereals improved in the South and at the close of the period spring oats were being sown north to Oklahoma and Arkansas.

The abnormally warm weather during the last decade caused a complete disappearance of the few patches of snow remaining in the Winter Wheat Belt and fields were greening north to Iowa and New York. Condition of the crop appeared satisfactory generally, except for some complaints in the Ohio Valley, particularly to the late-planted. Some spring wheat was seeded and preparations for seeding spring oats advanced rapidly with a little put in locally north to Kansas.

Miscellaneous crops.—The abnormally warm weather during the month was very favorable for livestock interests; shed lambing especially was benefited. The disappearance of the snow cover opened much range and permitted active grazing, with a consequent saving of feed. There were reports of continued dryness in the Southwest, especially in eastern New Mexico and western Texas, but in most other of the great western grazing sections range and water conditions were satisfactory.

Those truck crops which survived the freezes in January continued in satisfactory condition and spring planting progressed well throughout the month, except on some wet lowlands in Florida. At the close of the month planting potatoes and early garden crops had advanced north to Maryland and in the Middle West to Missouri. The abnormally warm weather caused fruit buds to advance prematurely and at the close of the month swelling was reported north to southern Wisconsin and color showing in some early varieties to southern Indiana. Peaches and plums were in full bloom in parts of the Gulf section. Citrus groves did well in Florida and California.